

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicants: George E. Barringer, Jr., Stephen C. Phillips and Mark J. Phillips  
Application No.: 10/600,177 Group: 1795  
Filed: June 20, 2003 Examiner: Alexander Stephan Nogueroles  
Confirmation No.: 9752

For: **METHOD AND APPARATUS FOR OPERATING AN AUTOMATED  
CAPILLARY ELECTROPHORESIS SYSTEM (AS AMENDED)**

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**REPLY BRIEF**

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Sir:

This Reply Brief is being filed in response to the Examiner's Answer mailed from the U.S. Patent and Trademark Office on February 18, 2010 in the above-identified application.

I. STATUS OF CLAIMS

Claims 27-52 have been finally rejected. Claims 27-52 appear as originally filed. In the Reply After Final Rejection under 37 C.F.R. § 1.116 filed on May 27, 2009, no claims were cancelled, amended, or added. Claims 27-52 have been appealed herein. A copy of the appealed claims appears in the Claims Appendix of the Appeal Brief filed in the U.S. Patent and Trademark Office on November 7, 2009.

II. GROUND OF REJECTION TO BE REVIEWED ON APPEAL

- A. Claims 27 and 52 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Virtanen *et al.* (U.S. Patent No. 6,402,919, hereinafter “Virtanen”).
- B. Claims 39, 40, 49, and 51 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Virtanen.
- C. Claims 28-34, 36, and 41-46 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Virtanen in view of Nikiforov *et al.* (U.S. Patent No. 7,060,171, hereinafter “Nikiforov”).
- D. Claims 34 and 35 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Virtanen in view of Nikiforov, and further in view of Li *et al.* (U.S. Patent No. 6,375,819, hereinafter “Li”).
- E. Claim 37 stand under 35 U.S.C. § 103(a) as being unpatentable over Virtanen in view of Nikiforov, and further in view of Sarrine (U.S. Patent No. 5,147,522, hereinafter “Sarrine”).
- F. Claim 38 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Virtanen in view of Nikiforov, and further in view of Karger *et al.* (U.S. Patent No. 5,348,633, hereinafter “Karger”) or Sarne *et al.* (U.S. Patent No. 7,261,801, hereinafter “Sarne”).
- G. Claims 47 and 48 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Virtanen in view of Li.

H. Claim 50 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Virtanen in view of Sarrine.

III ARGUMENT

Response to Examiner's Answer, Section 10, Part A

Appellants' Claim 27 recites "a controller ... including **executable instructions to convert and execute operational input** to control the valve for providing a sample of the liquid source to the capillary electrophoresis column." (emphasis added). The Examiner's Answer mailed on February 18, 2010 (hereinafter referenced as "Answer") states that "using a programmed computer that accepts user input to control operations during a capillary electrophoresis run was anticipated or obvious at the time of the alleged invention." Specifically, the Answer states that the elements of Appellants' Claims 27 and 52 are taught by Virtanen.

Regarding the Virtanen reference, the Answer in section 10, part A, beginning on page 31, points to column 3, lines 36-37 and column 4, lines 35-46 of Virtanen and states that Virtanen teaches "a microprocessor [used] to control various operating functions, including valve control, and operating parameters of a capillary electrophoresis run that are selected and may be adjusted by a person before and even during [an] electrophoresis run," interpreting these features to be similar to Appellants' "convert[ing] and execut[ing] operational input."

Appellants respectfully disagree with the Answer's assessments and submit that Virtanen does not teach "a controller ... including **executable instructions to convert and execute operational input** to control the valve for providing a sample of the liquid source to the capillary electrophoresis column," as required by Appellants' Claim 27 (emphasis added).

Virtanen relates to a capillary electrophoresis apparatus that includes background solution containing reservoirs interconnected using a separating capillary, one or more solution reservoirs positioned on an injection side of the apparatus, and one or more solution reservoirs positioned on a detector side of the apparatus. Virtanen states on column 3, lines 36-37 that "[o]peration of the entire apparatus can be controlled by means of a microprocessor." However, Virtanen offers no suggestion of what additional

components would be needed or what specific functionality would be required for the microprocessor to control the apparatus.

The Answer broadly interprets Virtanen's sentence about a controller in column 3, lines 36-37 and also a description of modifying running conditions in column 4, lines 35-46 and concludes that, since Virtanen suggests modifying running conditions during a run, Virtanen also discloses the foregoing elements of Appellants' Claim 27. Specifically, the answer states on page 33, beginning at the third-to-last line, that Virtanen is disclosing "using a microprocessor to control various operating functions, including valve control, and operating parameters of a capillary electrophoresis run that are selected and may be adjusted by a person before and even during the electrophoresis run."

Appellants do not disagree that Virtanen discloses adjusting operating conditions during an electrophoresis run, but respectfully disagree that such disclosure can be interpreted to anticipate the relevant elements of Appellants' Claim 27 (i.e., "convert[ing] and execut[ing] operational input to control the valve"). Appellants maintain that Virtanen can either (i) have executable instructions that execute with preconfigured (i.e., hard coded) operational input (e.g., time delay values or numbers or indicators representing valves) or (ii) have executable instructions that execute as a function of operational input optionally received from a source external from the processor (e.g., machine or user-provided operational input). In either case, the executable instructions are what cause Virtanen's electrophoresis machine to change states, not Virtanen's operational input.

Appellants respectfully submit that Virtanen's operational input, assuming employed, would be in the form of numbers or indicators representing time delays (e.g., 1 second, 2 seconds, etc.) or valves (e.g., "1" = valve no. 1, "2" = valve no. 2, etc.) or other elements of his machine. Appellants agree that Virtanen's operational input would be converted into a digital form such that a processor can read and process Virtanen's operational input, as well known in the art. Appellants contend, however, that conversion of Virtanen's operational input into a digital form would not be done by Virtanen's microprocessor since such conversion is carried out in advance to put Virtanen's operational input on communications lines to his microprocessor. Even if the conversion

of Virtanen's operational input were done by Virtanen's microprocessor, Virtanen's microprocessor would not then execute the digital form of Virtanen's operational input since Virtanen's operational input would be a number or indicator, neither of which being not instructions executable by a microprocessor. Instead, Virtanen's microprocessor would execute internal microprocessor instructions as a function of Virtanen's converted operational input, which is substantively (not semantically) different from Appellants' pending Claim 27, which requires, "executable instructions to convert and execute operational input."

Claims 39 and 52 recite similar patentably distinguishing elements as Claim 27. Accordingly, Appellants respectfully submit that Claims 39, 52, and all claims depending from Claims 27, 39, and 52 are allowable for at least the reasons presented above.

Response to Examiner's Answer, Section 10, Part B

Responsive to the Answer in section 10, part B, beginning on page 31, Appellants refer to remarks presented above.

Further, the Answer on page 34 states that "the controller in Virtanen is not an inflexible hard-wired circuit that is only used to have the capillary electrophoresis apparatus analyze the same sample type under the same operating conditions for every electrophoresis run." However, Appellants are not arguing that Virtanen's controller is inflexible and/or hard-wired. In fact, it is likely that Virtanen's controller is programmable, is configured with executable software instructions, and executes instructions as a function of operational input. However, Appellants maintain a position that Virtanen's controller does not "convert and execute operational input."

Appellants' claimed invention exceeds the scope of what would be found inherently at an intermediate stage of processing in a controller for an apparatus such as Virtanen's. Virtanen merely provides a single sentence directed to such a controller and leaves unclear exactly which additional components would be needed or what specific functionality would be provided. Virtanen's disclosure at most teaches an ability on the part of a user to vary input parameters and initiate operation. Therefore, Virtanen's disclosure at most suggests executing instructions as a function of operational input and

is silent in terms of “convert[ing] and execut[ing] operational input,” which involves more sophisticated processing at an intermediate stage than Virtanen teaches or suggests.

Furthermore, Virtanen does not enable a person of ordinary skill in the art to make Appellants’ claimed invention. The implications described above (*i.e.*, that Virtanen would have such additional elements regarding Appellants’ Claim 27 that are not expressly disclosed) are not clear to a chemist, who is the relevant person of ordinary skill in the art of capillary electrophoresis, which is the relevant art in the context of embodiments of Appellants’ claimed invention. In other words, although the Answer in the paragraph bridging pages 4 and 5 states that Virtanen implies existence and functionality of intermediate processing components, a person of ordinary skill in the art of capillary electrophoresis would not be skilled in electronic devices and electronic processing and would not have been enabled, based on Virtanen alone, to design a system to “convert and execute operational input” as in Claim 27 (emphasis added). A Declaration under 37 C.F.R. § 1.132 submitted on May 27, 2009, and submitted as a copy in the Evidence Appendix (Section IX) of the Appeal Brief filed on November 2, 2009, provides further support for who would be considered a person of ordinary skill in the capillary electrophoresis art at issue.

Claim 52 recites similar patentably distinguishing elements as Claim 27. Accordingly, Appellants respectfully submit that Claim 52 is allowable for at least the reasons presented above.

#### Response to Examiner’s Answer, Section 10, Part C

Responsive to the Answer in section 10, part C, beginning on page 37, Appellants refer to remarks presented above.

Further, in the non-final rejection of Claim 39, the Office Action conceded that Virtanen does not specifically mention “in response to converting and executing operational input, controlling the flow of the liquid source to the inlet chamber to provide a liquid sample in a controlled manner to the end of the capillary electrophoresis column.” Appellants respectfully submit that such concession alone provides further weight to the impropriety of the anticipation rejection of Claim 27, as discussed above, and similarly Claim 52.

Claims 39 recite similar patentably distinguishing elements as Claim 27. Accordingly, Appellants respectfully submit that Claim 39 is allowable for at least the reasons presented above.

Response to Examiner's Answer, Section 10, Part D

Responsive to the Answer in section 10, part D, beginning on page 37, Appellants refer to remarks presented above.

Claim 32 depends from independent Claim 27. Accordingly, Appellants respectfully submit that Claim 32 is allowable for at least the same reasons as Claim 27.

Response to Examiner's Answer, Section 10, Part E

Responsive to the Answer in section 10, part E, beginning on page 40, Appellants refer to remarks presented above.

Furthermore, Claim 37 is additionally patentable at least for reciting "detect[ing] errors in the operational input." Sarrine was introduced as a secondary reference in the obviousness rejection of this claim. The non-final Office Action states, at page 19, line 14, that Sarrine discloses an automatic electrophoresis apparatus and control having "an input signal regarding the alignment of the sample source. The automation means is configured to detect an error in this signal." However, Sarrine's error detection of an input signal is patentably distinct from error detection of "operational input" as in Appellants' Claim 37, since Sarrine's error detection is of the kind conventionally found in automation systems. Accordingly, Appellants respectfully submit that Claim 37 is allowable for at least the reasons presented above.

**CONCLUSION**

In view of the foregoing and the arguments already presented in the Appeal Brief filed on November 2, 2009, the Office has failed to show where each of the claim elements are identically disclosed in the cited art or otherwise taught by a combination of cited art. Accordingly, reversal of the rejections is respectfully requested.

Please charge any deficiency or credit any overpayment in fees that may be due in this matter to Deposit Account No. 08-0380.

Respectfully submitted,

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